Where *do* new plants come from?

BY DAN HEIMS

Horticulturist Luther Burbank developed Shasta daisies (above) in the 1890s by crossing ox-eye daisy with several other daisies, including Montauk daisy. The resulting daisy plant was more robust and vigorous than the wild ox-eye, and it produced larger blooms. Burbank did this work near Mt. Shasta in Northern California and named his new daisy after the location.
PHOTO COURTESY OF HGTV HOME PLANT COLLECTION

When the first Wave™ petunia debuted in 1995, it took the gardening world by storm with its dramatic spread, long bloom time and weather resistance.
PHOTO BY SHIRLEY BOVSHOW/ GARDEN WORLD REPORT SHOW

ALLAN ARMITAGE once said, "New plants are the lifeblood of our industry."

He's right. New plants fuel the California Spring Trials, Cultivate and the Farwest Show's New Varieties Showcase. Nobody ever asks, "What's old?"

Despite all the effort and hype that may surround a new plant, few truly know the answer to the question, "Where do new plants come from?" I'm here to fill you in.

Three elements are necessary to get a plant to market: the breeding company, the mass-propagator and the promotion company. With the speediness of modern transit and greenhouse technology, hundreds of thousands of plant cuttings can be sent from places like Costa Rica or Kenya to rooting stations around the world in a mere 72 hours.

Let's investigate each piece of the puzzle.

The Breeder

Releasing a new plant can take a breeder many years. While annuals are fairly easy to advance with quick results, perennials take an average of three years, shrubs longer and trees longer still. The royalties assigned to each crop are reflected in the length of time it takes to breed, as well as any complexities of propagation.

A rhododendron breeder once summed it up as he looked at Terra Nova's comparatively short introduction period and said, "Oh, you should try rhododendrons, Dan … 14 years of anticipation and one second of disappointment!"

While there are a number of new plants that have been "found" as sports on garden plants or in nature, it took horti-heroes like Luther Burbank to show the world how he could develop a gorgeous range of plants like *Leucanthemum* (Shasta daisy) from a weedy nothing.

Breeder Ushio Sakazaki created a whole new world of Wave™ petunias from a roadside weed he found in Brazil.

A good breeder has to have a number of traits: patience, persistence, plant knowledge and a propensity for plenty of recordkeeping!

I have often compared the breeder to an artist. Once a breeding aim (for example, shorter plants with more crowns) is determined, the "artist" begins to collect different species like a painter would collect paint colors for his palette to achieve the goal. Many times this will entail travel to different parts of the world, and often exchanging seed and pollen with plant

enthusiasts or horticultural institutions.

With the "palette" in hand, the breeder begins a series of crosses, notating the parents and attaching tags to the flower heads with the date and parentage. These crosses must be done without the intervention of insects (who would love to help!). Typically, crosses are done in a greenhouse or, if done in the field, there are special precautions that must be taken to disallow insect accessibility.

Seed is collected from the crosses, while still tracking the cross. It is then labeled, dried, treated and sown in mass quantities. Tens of thousands of seedlings are germinated and then moved from seedling flats to plug trays or to 4-inch or larger pots.

Breeders must be ruthless killers, too. Only the most vigorous, best-performing seedlings are selected to move on to larger pots or the field for further evaluation. At some nurseries, including the one where I work, these decisions are made with input from breeders, laboratory managers, salespeople and greenhouse growers.

We're all looking to see something that's easily propagated, grows well in the greenhouse and is marketable.

The Propagator

Once a plant has gone through the trial process (which again, may take years), it is bound for the propagator with a number of caveats.

First, a plant has to be clean of viruses or other pathogens. This is typically done as the plant is placed into the tissue culture process. Companies like Agdia Testing Services specialize in testing plants for a panel of pathogens. If the plant proves clean, it is placed in tissue culture for further rounds of testing with different formulations of media made for optimum results in strength and numbers.

As the resultant plants are moved to soil, they go through further testing in the field or greenhouse while being checked for uniformity in foliage and flower. Plants are then sent to botanical gardens, garden writers and garden trials in the U.S. and abroad for feedback on hardiness and vigor.

Provided a positive response from these trials, plants are again sent in sealed vessels from tissue culture to labs and propagators around the world. If plants can be grown from cuttings, they are placed in sanitary greenhouses where they are grown into masses of mother plants, from which cuttings are taken at regular intervals.

If a plant can only be propagated in tissue culture, then other labs are licensed to increase the cultures to reach numbers. Protection of a plant from illegal propagators is essential and expensive. Pirate labs do exist.

International plant police organizations like DSG (Deutsche Saatgutgesellschaft mbH Berlin) and RAI (Royalty Administration International) keep a keen eye on violations from abroad and in greenhouses in the U.S. that propagate illegally.

The Promoter

I've always said, "Without a photo, you don't have a plant!"

During the trialing period, plants are measured and photographed in different locales. Companies like Terra Nova Nurseries, Hort Couture, Plantipp and Plant Haven then assemble a collection of the new introductions and begin the process of promotion. Catalogs, magazine copy, social media and special showings such as the Proven Winners Roadshow are a beginning.

Then there's garden writer samplers, garden shows and the big trade shows like the Farwest Show, California Spring Trials, Cultivate, Plantarium in Holland and IPM ESSEN, which is the world's largest plant trade show with 1,600 exhibitors from 50 nations and 57,000 visitors. A centerpiece of the world-renowned RHS Chelsea Flower Show is its "Plant of the Year" competition, highlighting the very best new plants.

New plants are big business. Each new plant reflects tens of thousands of dollars in costs for breeding, testing, patenting and promotion. If you meet a breeder, thank them for their diligence and creativity, for they are often the unsung heroes.

Dan Heims is president of Terra Nova Nurseries Inc. He is also an author, world-wide lecturer and a certified hortiholic.